SOME EXPERIMENTS IN THE DIGITAL EXTRACTION OF AMERICAN
INTONATION PATTERNS

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Many models of intonation patterns for American English have
been proposed by linguists and phoneticians. However, none of
them, including both auditory-analysis models and instrumental-
analysis models, seems to be accepted as valid and reliable. We
believe that one of the best approaches to the study of intonation
is the one in which the instrumentally extracted physical data
(the frequency contour) are processed until they match the
auditory recognition of intonation contrast. A number of data
processing techniques (normalization, transformation, and feature
extraction) were tested and introduced in this study to increase
the validity of the patterns to be obtained by the instrumental
technique. The principle of "relevancy" or "distinctiveness" in
linguistic signals and the computation of the index of signal
detectability (d') were used as the criteria to measure and
compare the validities of the developed computer algorithms.

The computer programs developed in this study were tested at
each step of the data processing using three sets of utterances,
and also in an integrated set of a simulation program developed
for determining intonation patterns. The digital technique was
found to be useful to determine intonation patterns of American
English for a theoretical study of the intonation system, and
also for a practical application of building a teaching machine
which can help foreign students or persons with speech problems
learn American intonation effectively.